

Video Preservation - The Basics

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- [David Jones of Dave Jones Design](#)
- [Independent Media Arts Preservation](#)

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Background and History

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- [The Video History Project](#)
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Why Video Preservation - The Basics

This guide is aimed at arts and cultural organizations that are relatively new to the field of moving image preservation and conservation. Since the early 1990s, there has been a growing national effort to save independent electronic media, including collections of video art, audio art, and technology-based installation art; independent documentary and narratives; community media; and documentation of arts and culture.

As a participant in this effort, the Experimental Television Center recognizes that many important tapes exist outside of major institutions, in artist spaces, libraries, community organizations and with individuals. Many groups have become de facto archives of independent media; many don't have staff trained to deal with archival issues. Even larger organizations, among them many public television stations, lack the resources to begin to protect their holdings in any formal way. Individuals, focusing on production, may have even less experience with and knowledge of preservation efforts. Until recently, members of the independent media communities have had little contact with professional organizations dedicated to this work, and the voice of independent media was rarely heard in national forums on preservation.

We hope this guide serves to give media groups and media-makers the information useful to them in efforts to save their collections, connect with others with similar concerns, and bring the concerns of independents to the field of electronic media preservation.

Video Preservation - The Basics is an activity of the Video History Project organized by the Experimental Television Center.

The Video History Project

The Video History Project is an on-going research initiative documenting the early historical development of video art and community television, with particular focus on upstate New York during the period 1968-1980. The project has been conceived and executed by the Experimental Television Center. The project involves an interrelated set of activities combining research, the collection of oral histories, a World Wide Web site, and *Video History: Making Connections*, a conference concerning the links between the early history and contemporary practice, and held at Syracuse University in the Fall 1998. The project goals are to identify and make accessible information which describes and locates resources concerning independently created media; to facilitate partnerships for preservation of the works; to encourage the exhibition and study of these materials among curators, educators, and scholars; and to increase public awareness of and appreciation for media history throughout the State and nationally.

New York State has played a unique role in the historical development of the field. Some of the earliest video art and community television media activity in the nation occurred here. The preservation area on the [Media Alliance](#) website provides descriptions of a few of these important groups. Media Alliance provided the media arts field with comprehensive information and technical assistance on all aspects of preservation, and is nationally recognized for its collaborative projects, including a Regional Cataloging Project coordinated by cataloger Jim Hubbard, and a series of preservation surveys conducted by conservator Paul Messier. Media Alliance also published [Video Preservation: Securing the Future of the Past](#), by Deirdre Boyle, and the [Magnetic Media Preservation Sourcebook](#), edited by Mona Jimenez and Liss Platt.

Independent Media Arts Preservation

[Independent Media Arts Preservation](#)

A service, education, and advocacy consortium, IMAP was organized in 1999 to ensure the preservation of independent electronic media for cultural and educational use by future generations. These works are found throughout the country in museums, arts centers, artists' spaces, dance and theater companies, libraries, university departments, non-profit distributors, public television stations, and with individual artists or producers. IMAP is especially interested in supporting the preservation of works reflecting the early history of independent media, when producers first expanded the options for media production and distribution beyond commercial applications of electronic tools and traditional forms of broadcast television. IMAP is the only art service organization focused solely on issues of electronic media preservation.

IMAP's primary interest is to support the preservation of works reflecting the early history of independent media, and focuses on the preservation of non-commercial productions such as video art, audio art, and technology-based installation art; independent documentary and narratives; community media; and documentation of arts and culture.

IMAP was formed in part to continue the leadership formerly undertaken by the New York-based organization Media Alliance.

IMAP consortium members represent a wide range of organizations and individuals including the Museum of Modern Art, the Donnell Media Center, the National Museum of the American Indian, the Jewish Museum, the Whitney Museum, the Experimental Television Center, Hallwalls Contemporary Arts Center, Paper Tiger Television, Third World Newsreel, Syracuse University, Bay Area Video Coalition, Wexner Center for the Arts, and the Video Data Bank as well as artists, curators, and educators concerned with the preservation of the independent media arts.

Role of an Archivist

If you have a collection of videotapes, it is important that you or your organization become involved in preservation. Videotape is not an archival medium. Because of many factors, including storage conditions, and technical problems in the original manufacturing, the tapes themselves can deteriorate. In addition, many of the early formats and the equipment on which to play them are now obsolete.

Jim Wheeler has outlined the functions of an archivist. His recommendations are available in [Television and Video Preservation 1997: A Report on the Current State of American Television and Video Preservation](#), Volume 5, by William T. Murphy. Report of the Librarian of Congress. Government Printing Office Superintendent of Documents.

- To collect materials according to the policy and mission of your organization
- To organize the collection
- To safely store the materials in the collection
- To catalog the materials so you can access information about it easily and share that information with others
- To provide access to the works, if this is part of your organization's mission, by providing appropriate playback equipment
- To put materials onto contemporary formats

The Society of American Archivists suggests "The primary task of the archivist is to establish and maintain physical and intellectual control over records of enduring value. The archivist selects, arranges, describes, and ensures the long-term preservation of such records, and assists researchers who wish to use them." See the FAQ section of the [Society of American Archivists](#).

What Can Go Wrong with Your Tapes

Videotape is not an archival storage medium. Problems can arise because the tapes were not properly recorded originally or have been subsequently damaged. There are several general types of problems which are often caused by a mishandling, improper storage, malfunctioning equipment or disaster. For more information see Video Terms, Care and Handling, Storage and Insurance and Disasters areas. The National Technology Alliance Online provides access to the [National Media Lab's Media Stability Studies](#). Included is the report "Information on Storage Media Longevities".

- The tape itself can be physically damaged by mishandling, or playing the tape on poorly maintained equipment. The edges of the tape are often damaged by a misaligned tape transport systems on the deck, and by excess or uneven tension when rewinding the tape. Tapes can also be stretched and creased.
- The binder on the tape can deteriorate. This may cause the video heads to clog with debris, drop out, sticking or slipping of the tape and squealing as the tape is played. It is often caused by improper storage conditions.
- The magnetic signals on the tape can be damaged by exposure to magnetic fields, inadvertent erasure or re-recording.
- The original recording may be faulty because of tracking or sync problems caused by the original recording equipment.
- The tapes can be damaged or destroyed by extremes of heat and humidity or by a physical disaster, such as flooding.

Selected Chronology of Preservation Activities

1960s

In 1965 legislation creates the National Endowment for the Arts, which establishes The

American Film Institute. One of the goals of the AFI is to preserve our heritage of film and television.

Representatives of moving image archives, originally known as the Film and Television Archives Advisory Committee (F/TAAC), begin to meet.

1970s

The New York State Council on the Arts funds cataloging and library activities for film in the early 1970s.

1980s

Under the leadership of Debby Silverfine, Director of the Electronic Media and Film Program at The New York State Council on the Arts, a support category for preservation activities is established.

Electronic Arts Intermix receives one of the first grants from the New York State Council on the Arts for preservation activities.

The National Endowment for the Arts assists preservation efforts in several disciplines, including media arts, folk arts and dance.

Throughout the decade many organizations and individuals engage in efforts to preserve collections. Among them are the Andy Warhol Foundation, Anthology Film Archives, Bay Area Video Coalition, Downtown Community TV Center, Electronic Arts Intermix, Experimental TV Center, Intermedia Arts of Minnesota, The Kitchen, Museum of Modern Art, Pacific Film Archives, Video Data Bank, Tony Conrad, Bob Harris, Woody and Steina Vasulka and many others.

1984

The National Center for Film and Video Preservation is established by the American Film Institute and the National Endowment for the Arts. Its mission includes The Film Foundation, The Association of Moving Image Archivists (AMIA) and the National Moving Image Database (NAMID) project which centralizes information on the film and television holdings of American archives and producers, and has assisted many organizations with the cataloging of film and video collections.

1985

Image Permanence Institute founded through the combined efforts of Rochester Institute for Technology and the Society for Imaging Science and Technology

1987

Tony Conrad publishes several articles concerning methods of reel-to-reel videotape restoration through the NY Media Decentralization Institute and Hallwalls in Buffalo.

1990

The Film and Television Archives Advisory Committee (F/TAAC), changes its name to the Association of Moving Image Archivists (AMIA).

1991

Symposium on Video Preservation is hosted by the Museum of Modern Art and organized by Media Alliance, under the leadership of Mary Esbjornson, and by the New York State Council on the Arts.

AMIA votes to formalize as an individual-based professional association.

The Andy Warhol Foundation begins the preservation of its media collection under the leadership of Mirra Banks Brockman, work later completed by Dara Meyers-Kingsley.

The Independent, published by the Association of Independent Video and Filmmakers, publishes an article by Stephen Vitiello and Leanne Mella, "Facilities for Cleaning, Restoring, and Remastering Videotape" in October 1991

Ralph Hocking proposes the "resurrection bus", a mobile service to clean and re-master old video.

1992

The National Alliance for Media Arts and Culture established a national Video Preservation Task Force.

1993

Publication of Deirdre Boyle's Video Preservation: Securing the Future of the Past, published by Media Alliance.

Bay Area Video Coalition receives support from the National Endowment for the Arts to establish a center for re-mastering obsolete formats of videotape, under the leadership of Sally Jo Fifer and Luke Hones.

Groundbreaking for the Film Preservation Center of the Museum of Modern Art.

1994

Media Alliance convenes a meeting of key New York media organizations. Cataloging was identified as an important first step, using a compatible database

Media Alliance, under the direction of Mona Jimenez, proposes to the National Endowment for the Humanities a model partnership with the NAMID program to achieve compatible cataloging among media organizations across a broad geographic area. Although never funded, the proposal provides a foundation for collaboration on cataloging. Organizations included were Anthology Film Archives, Art Media Studies Department of Syracuse University, Centro de Estudios Puertorriquenos, Experimental Television Center, Everson Museum of Art, Hallwalls, Media Bus, Paper Tiger Television, Port Washington Public Library, Tisch School of the Arts of New York University, Visual Studies Workshop and Woodstock Public Library.

The Upstate Cataloging Project meets in Rochester in August with Margaret Byrne, Director of NAMID. Representatives of ETC, Hallwalls, Syracuse University, and Visual Studies Workshop. This results in the adopting of a NAMID-compatible template, designed to allow conversion to USMARC.

1995

The Upstate Cataloging Project holds a training session in May, supported by Media Alliance and led by Jim Hubbard, associated with Anthology Film Archives, with assistance from Henry Mattoon, Director of NAMID.

Bay Area Video Coalition opens the first non-profit remastering facility for 1/2" open reel tape, under the direction of Luke Hones.

1996

In March the Library of Congress holds hearings in Los Angeles, New York and Washington, DC for the Study of the Preservation of Television and Video, conducting a national needs assessment and resulting in a set of recommendations in areas such as cataloging, cleaning and remastering, education and storage.

Meeting the Challenges of Video Preservation, by Jim Hubbard, with assistance from Mona Jimenez, is published by Media Alliance.

Playback 1996: Video Preservation Roundtable, held in San Francisco on March 29-30, and organized by the Bay Area Video Coalition with assistance from Media Alliance. The international symposium, funded by the Getty Foundation and the Andy Warhol Foundation for the Visual Arts, is the first to build alliances between the media arts and art conservation fields. Transcripts of [Playback 96](#) conference sponsored by BAVC.

1997

With funding from the National Endowment for the Arts, Media Alliance contracts with Paul Messier of Boston Art Conservation to conduct preservation surveys with six media arts groups in New York State. Media Alliance Preservation Survey is published.

1998

Magnetic Media Preservation Sourcebook, edited by Mona Jimenez and Liss Platt, published by Media Alliance

Playback: A Preservation Primer for Video edited by Sally Jo Fifer, Tamara Gould, Luke Hones, Debbie Hess Norris, Paige Ramey and Karen Weiner is published by Bay Area Video Coalition.

Video History: Making Connections, a conference concerning the links between early media history and contemporary practice, was held October 16-18, 1998 at Syracuse University in conjunction with the Common Ground Conference, sponsored by the New York State Alliance for Arts Education. Bringing together over 250 media makers active in the 70s and those artists working today in new media and interactive technologies, the conference celebrated our history and established new partnerships with cultural and educational institutions across the country. The project is made possible with support from The Andy Warhol Foundation for the Visual Arts, the New York Foundation for the Arts Technology Planning Grant Program, with public funds from the Statewide Challenge Grant Program and the New York State Council on the Arts, and from the Everson Museum of Art and the Media Action Grant Program of Media Alliance, with corporate support from Dave Jones Design and VidiPax as well as individual contributors.

1999

Independent Media Arts Preservation (IMAP) is established, with support from the New York State Council on the Arts and the Rockefeller Foundation.

With support from the New York Foundation for the Arts, IMAP conducts a needs-assessment for a web-based cataloging tutorial and union catalog of independent media collections, under the direction of Jim Hubbard.

IMAP begins a technical assistance program for NYS media arts groups.

2000

Bay Area Video Coalition organizes *TechArcheology: A Symposium on Installation Art Conservation*, held at the San Francisco Museum of Modern Art, and supported by the Getty Foundation.

2001

Preserving the Immaterial: A Conference on variable Media at the Solomon R. Guggenheim Museum on March 30th and 31st, 2001. The focus of the conference is the museum's Variable Media Initiative, a radical new solution to the contested issues of new media preservation.

2002

Media Preservation Salon hosted by NAMAC, facilitated by Jim Hubbard and Mona Jimenez. Panelists include Sherry Miller Hocking (Experimental Television Center), Karan Sheldon (Northeast Historic Film), Toni Treadway (International Center for 8mm Film), Stepen Vitiello (The Kitchen), Heather Weaver (Bay Area Video Coalition), and others.

Looking Back/Looking Forward, May 31 and June 1, 2002, a symposium intended as a working session where artists, media arts staff, conservators, and technical experts will focus on the physical preservation of independent electronic media. The symposium is organized by the Experimental Television Center (ETC) in association with Independent Media Arts Preservation (IMAP), Bay Area Video Coalition and the Electronic Media Specialty Group of the AIC (American Institute for the Conservation of Artistic and Historic Works). Looking Back/Looking Forward is hosted by the Downtown Community Television Center and is made possible with public funds from the Electronic Media and Film Program of the NYS Council on the Arts, and assistance from IMAP and Dave Jones Design. The symposium is organized by Sherry Miller Hocking, Assistant Director of the Experimental Television Center, and independent consultant Mona Jimenez.

Preservation Terms and Definitions: Publications, Resources and Links

- [Video Preservation Terms](#)
- [Consulting and Treatment Services](#)
- [General Archival Terminology](#)
- [Audio](#)
- [Media Reformatting](#)

Video Preservation Terms

[Video Preservation: Glossary of Terms](#) by Rebecca Bachman

Originally published in 1996 for Playback 1996: Video Roundtable, a symposium organized by the Bay Area Video Coalition, the glossary was also published as part of Playback: A Preservation Primer for Video, Bay Area Video Coalition, 1998. To order this publication, see the [BAVC](#) web site.

[Obsolescence Ratings](#) by Sarah Stauderman

A section of the Video Format Identification Guide. Terms such as "extinct", "critically endangered", and "threatened" are defined, and assigned to tape formats from 1956 to the present. The site is a project of the [Electronic Media Special Interest Group](#) of the [American Institute for Conservation of Historic and Artistic Works](#).

Magnetic Tape Storage and Handling: A Guide for Libraries and Archives. Dr. John W. Van Bogart Washington, DC: The Commission on Preservation and Access, June 1995. Appendices include a bibliography, glossary. The paper was a joint project of and can be ordered from the [Council on Library and Information Services](#) (CLIR), Commission on Preservation and Access, and National Media Lab.

[Glossary of Video Preservation terms](#)

[Glossary for Preservation Terms, assembled by IMAP](#)

Consulting and Treatment Services

The following list of terms is adapted from the chapter "Definitions of Terms for Consulting Services and Treatment Services" in the [Magnetic Media Preservation Sourcebook](#), published by Media Alliance in 1998. Co-editors Mona Jimenez and Liss Platt defined common terms used for preservation/conservation to clarify how they had organized the entries. A description of the Sourcebook can be accessed on the web. To order a copy of the Sourcebook, contact [Media Alliance](#).

Consulting Services

Appraisal - an evaluation of the value and/or use of a collection.

Cataloging - systems for arrangement and description of collections or tapes; or a means of logging visual/audio information contained on the media.

Collection assessment/surveys - assessments of the conditions and situations in which materials are stored and the physical characteristics of the objects themselves, with recommendations about preservation actions and priorities.

Collection management - consulting on how the collection is organized and cared for, may include systems for description, tracking, storage, handling, access and preservation.

Environmental surveys - assessments of the physical environment in which media are stored and handled, including such areas as temperature and humidity, air quality, environmental pollutants, and shelving.

Grant development/consultation - assistance in identifying funding sources for preservation, and in developing a fundable project, and/or developing or reviewing funding proposals.

Preservation project planning and development - assistance in developing an ongoing preservation program in the context of an organization's overall goals, activities and structures. May include such areas as budgets, work plans, procedures/manuals, and disaster planning and recovery.

Preservation project management - guiding, managing and/or carrying out a preservation project for an organization.

Preservation training - the design and/or delivery of training on preservation issues.

Storage facilities consultation - assistance with the design, construction and/or management of a storage facility.

Treatment services

Cleaning - treatment of the media to remove or reduce such things as dirt, dust, mold and other contaminants.

Inspection/evaluation - assessment and/or description of the physical characteristics of the media before or during the preservation process; may include assessment and the prioritization of strategies for a set of objects.

Re-mastering - reformatting a tape that exists in an obsolete or endangered format, recorded on obsolete/rare equipment, or is beyond its shelf life, to a contemporary format. Does not include standard duplication of contemporary formats, even when there is a format change.

Repair/restoration - treatment of the tape or housing, such as cracked or broken cases, problems with wind, treating crinkling, creases, or broken splices.

General Archival Terminology

Glossary of Archival Terms

Preserve, Inc publishes Dance Archives: A Practical Manual for Documenting and Preserving the Ephemeral Art which includes a glossary.

National Collection of Screen and Sound Glossary of Terms at [ScreenSound Australia](http://www.soundscreen.org.au/glossary.html)

[Definitions of Conservation Terminology](http://www.conservationcanada.ca/terminology.html) describes typical terms used by conservators, defined by the AIC.

A/V Media Appraisal Nomenclature and Glossary. ERIC Clearinghouse on Information Resources Database, Syracuse University, Syracuse, NY (1993).

Starting an Archive. Elizabeth Yakel. Chicago: Society of American Archivists and The Scarecrow Press, 1994. Designed for institutional administrators, archivists, and records managers. Provides both theoretical and practical approaches for the establishment of an archival program and discusses managerial, financial, and administrative implications involved. Includes descriptions of archival activities, samples of important archival policy documents and forms, and a current bibliography.

News Media Libraries: A Management Handbook. Barbara P. Semonche, ed. Westport, CT: Greenwood Press, 1993. Includes chapter on television news libraries.

Audio

[The International Association of Sound Archives](#) (IASA)

IASA is a non-governmental organization affiliated with UNESCO and plans the publication of a Glossary of Technical Terms.

[Association for Recorded Sound Collections](#)

ARSC hosts a discussion list to facilitate the exchange of information on sound archives and promote communication among those interested in preserving, documenting, and making accessible the history of recorded sound. The list is sponsored by the Association for Recorded Sound Collections (ARSC) as a service to ARSC members and the archival community.

Sound: Theory and Practice A Narrative Glossary by Elisabeth Weis and John Belton, eds. Provides historical definitions of sound-on-disc, sound-on-film (single system and double system), recording, and stereophonic technologies.

Media Reformatting

[The Relationship Between Digital and Other Media Conversion Processes: A Structured Glossary of Technical Terms](#)

Includes definitions of video and other electronic media as originals, storage mediums, and distribution and presentation technologies. It was published in August 1990 as part of an exploration of how emerging technologies can be used for preservation and access of other materials, such as paper and photographs. The glossary was written by M. Stuart Lynn and The Technology Assessment Advisory Committee to the Commission on Preservation and Access.

The Association of Cinema and Video Laboratories (ACVL) Handbook: Recommended Procedures for Motion Picture and Video Laboratory Services Glossary. Association of Cinema and Video Laboratories, compiler. Indexes to SMPTE test materials and SMPTE-sponsored standards and recommended practices, and a list of ACVL-member labs.

Video Terms

- [Links to Other Video Glossaries](#)
- [A Basic Technical Glossary](#)

Links to Other Video Glossaries

Many of the glossaries found in Preservation Terms have definitions for general technical video and audio terms.

Conservation On Line

[Glossary of Technical Terms](#) by The International Association of Sound Archives (IASA)

Stauderman , Sarah. [Video Format Identification Guide Glossary of Video Terms](#)

Compiled as part of the Electronic Media Special Interest Group of the American Institute for Conservation of Historic and Artistic Works.

Glossary of Film and Electronic Media Terms

Glossary of Videotape Terms

Glossary of Video Terms

Glossary by Video Essentials

Glossary by Video Demystified

Glossary by High Tech Productions

Glossary by Grass Valley Group

A Basic Technical Glossary

This is a brief glossary intended for general interest. The above links contain more and detailed information.

Blocking

Adjacent layers of the tape as it is wound on the reel stick together. This can be caused by improper storage conditions, winding which is too tight or because of improper manufacturing of the tape.

Creases and wrinkles

Wrinkles or creases pressed into the tape by the capstan/pinch roller assembly on the record/playback deck or by another physical processes. If the tape is played back, the recorded information located on the creased areas breaks up.

Chroma

If the chroma level is too low, the colors look faded. If the chroma level is too high the colors are overly saturated. If there is noise in the area of the tape which contains the color information, the colors appear to be moving inappropriately.

Cinch

Refers to the folding over of the tape onto itself on the reel. This results in permanent folds or creases on the tape which cause picture disturbance. This can be caused if the tape has been stopped suddenly on the record/playback machine.

Control track

A signal recorded on the edge of the videotape which controls how the tape tracks and its speed. If this track is damaged or improperly recorded, the picture can be unstable or jumpy.

Crease

A tape deformity which may cause horizontal or vertical lines in the playback picture.

Crosstalk and Print Through

This refers to interference of the taped signal by another signal, which results in distortion of the image or sound. This can occur if signals on the tape imprint themselves onto nearby areas of the tape where they don't belong. It is most noticeable on audio recordings; you may be able to faintly hear a ghost of the other unwanted signal when the tape is played back.

Dropout

Dropout appears on the picture as small white spots or streaks. It can be caused by physical deterioration of the tape itself, or by contamination of the tape with dirt or dust. It results in signal loss because the heads that read and display the picture information become clogged or dirty.

Edge damage

Physical damage to either the upper or lower edges of the tape results in playback problems. The type of problem depends on the location of the damage. The upper edge contains audio information. The bottom edge contains control track information.

Flagging

The top portion of the image appears to be bent horizontally. Also called skewing.

Generations

Refers to the number of "steps" away from the original a particular copy is. Because signal information is lost with successive copying of the tapes, generally the further away a tape copy is from the original, the worse the image and sound quality might be.

Head clogging

The heads are responsible for recording and display of the image. If they become dirty, they are not able to record and read the signal information on the tape. This causes poor image quality. If the heads were dirty when the tape was recorded, then the poor quality is on the tape itself. If the heads became dirty when the tape was played back, cleaning the playback deck heads may result in better image display quality.

Luminance

The black and white part of the video signal, seen as brightness.

Noise

Any unwanted signal present in the total signal.

Pack slip

This refers to uneven winding of the tape on the reel. If you look at the tape reel when it is laying horizontally, you will see high or low areas in the winding. If the winding isn't flat, the edges of the tape can be damaged.

Roll

The image appears to drift up or down because the synchronization signals recorded on the tape to keep it oriented horizontally and vertically are faulty, or because the recording or display equipment are malfunctioning.

Scratches

The tape is physically damaged, which results in the appearance of solid lines when the tape is played back.

Shedding and sticky shed

Videotape has a base layer underneath an oxide coating. The oxide coating is the recording surface. If these two layers separate, the oxide may begin to fall off and clog the heads.

Signal-to-noise ratio (S/N)

Refers to the proportion of desired audio and video signal information to undesired audio and video signal information, expressed in decibels (dBs). Higher numbers generally indicate better audio and video.

Skew

This problem appears as a bend in the top or bottom portion of the image and can be caused when the playback deck doesn't maintain the correct tension on the tape.

Snow

The random speckled black and white pattern that appears when there is noise present.

Squeal

This problem appears on playback and is caused by dirt or other substances on the playback equipment and also by a loss of lubrication on the tape.

Sticking

When a tape is played back, it can stick momentarily but repeatedly to one of the heads on the playback deck. The tape sticks, then releases, then sticks again. This can cause squealing and may physically damage the tape itself.

Sticky tape and shedding

This deteriorated tape has a tacky or gummy surface, which is soft. The binder and coating of the

tape can separate and the magnetic coating falls off when the tape is played back. This process of shedding produces dropouts and can leave gummy deposits on equipment.

Tape pack slip

A lateral slip of particular tape windings causes high or low spots in an otherwise smooth tape pack. These unevenly wound areas are easily seen when the tape reel lies flat. Pack slip can cause subsequent edge damage when the tape is played, as it will unwind unevenly and may make contact with the tape reel flange.

Termination

to complete a circuit by connecting a resistive load to it. A video termination is typically a male BNC connector which contains a 75 ohm resistive load. When there are looping inputs, any unused looping input must be terminated in 75 ohms to ensure proper signal levels and to minimize reflections.

Time base

Synchronizing signals are recorded on a tape, along with picture and sound information. This sync information enables the images to be played back in a stable fashion, oriented properly both vertically and horizontally. Changes in these synchronizing or timing signals cause time base errors that result in disturbances to the images.

Tracking

Tracking information is also recorded on the tape. If this tracking path isn't precisely followed when the tape is played back, the resulting tracking errors can produce unstable images.

Video signal-to-noise ratio

The ratio of usable signal to undesirable noise in a black and white picture.

Vinegar syndrome

This refers to the decomposition of an acetate based magnetic tape layer. It causes the tape to smell like vinegar and results in a faster loss of the backing.

Winding

The tape should be evenly wound onto the reel, with no high or low areas, and with an even tension, so the tape is not tight in some areas and lose in others. Pack slip refers to uneven winding.

Getting Started

- [Basic Planning Questions](#)
- [Evaluate & Improve Your Storage Environment](#)
- [Catalog Your Holdings](#)
- [Consultants and Colleagues](#)
- [Educate Yourself](#)
- [Preservation Planning and Management](#)

Basic Planning Questions

Many people think of preservation simply as the remastering of a given tape to a newer, more stable format. While important, this may not be the place to begin your preservation program. Planning and education will help you to prioritize how your funds and energies should be spent and help you to avoid re-inventing the preservation wheel.

Initial work emphasizes protecting the tapes from damage or deterioration, assessing what you have, and designing a plan with short-term and long-term goals. Of course, if you're in an emergency situation and the tapes are in immediate danger, you should seek professional help immediately; see the sections on Cleaning and Disasters .

All tapes are not equal. If you have a large collection, you probably need to consider priorities. The following questions can help you evaluate your holdings and establish short-term goals. This step helps you gather basic information to create a preservation plan and will help you explain your process to others outside your organization.

- How, when and why were the works acquired? Were they donated, produced, rescued?
- What is the value of the tapes? Why are they important to save? Who will use them?
- Do you have legal rights to the tapes? If not, can you identify the owner? Are rights potentially at question? How can copyright and ownership be addressed? Should these issues affect your actions toward preservation?
- Are there different collections within the holdings? How are these identified? Are some more valuable, unique, endangered? Do some pose more difficult preservation problems, for example ownership questions?
- What stage in the production process do the tapes represent? Are they masters, sub-masters, camera or audio originals, viewing copies?
- Which tapes or collections are unique, representing the only copy or one of only a few surviving copies?
- What are the finding aids for the holding? Do any tape lists or catalogs exist? What portion of the holdings do they represent?
- Do you know how the tapes have been stored?
- What is the overall condition of the tapes? Which tapes are on obsolete or endangered formats? Which are the oldest?
- Does the mission of your organization include preservation? If not, should it? Should you consider giving your collection to another organization better able to care for the work?
- What staff and financial resources can you commit to preservation on the short-term? Long-term?
- What do the above questions tell you about how to proceed?

Evaluate & Improve Your Storage Environment

Moving tapes to a stable environment will prolong their useful shelf life, and may forstall the need for more extensive physical preservation in the long run. Locate a clean, dust-free environment away from major electrical conduits; climate control will prevent severe temperature and humidity fluctuations. Monitor temperature and humidity to get accurate assessment of the environment. Tapes should be shelved upright, using metal shelves if possible. See sections on Storage and Care and Handling for more detail on these issues.

If you don't have a place for proper storage on-site, consider other options. If you can afford off-site climate-controlled storage, it may be a better solution. If not, can you identify another group that would agree to house your collection either temporarily or permanently? Establish a deadline by which you decide either to retain the tapes and take appropriate preservation steps, or to transfer the tapes to another institution.

Catalog Your Holdings

In some cases it makes most sense to catalog the tapes as you shelve them. In other cases, you need to get them out of boxes and upright and should deal with the reorganization later. Before you start shelving, consider an overall strategy:

- Do you already have a list or numbering system? If so, you can order the tapes on the shelves by this existing method of organization.
- Are there different discreet collections? If so, keep them together.
- If you have an advanced cataloging system that includes a shelf location, the most efficient way to store tapes is by format

You will want to do a basic inventory of your tapes on a computer, so you know what you have and can let others know. The initial catalog may only include a limited number of fields.

If you create a computer-based catalog template for your own use, you may cause yourself much unnecessary work. We recommend the standard template that is being used by many media arts groups for the Cataloging Project of Independent Media Arts Preservation (IMAP). The template uses the software program FileMaker Pro available for both the MacIntosh and PC platforms. For more information on the template and to download it, contact [IMAP](#).

Be aware that playing older tapes can permanently damage them beyond restoration. While cataloging, you may not be able to view the tapes but rather rely on the information on the storage box or reel, even if the information is incomplete.

See section on Cataloging for more information.

Consultants and Colleagues

You may want to consider hiring a consultant to complete a preservation survey. A preservation survey is a written report which documents the condition of your collection, examines the organizational and environmental conditions in which the work exists, and makes

recommendations for next steps. The survey is usually performed by an outside consultant - typically a moving image archivist or conservator. For non-profit organizations, this is often the first step to securing public or private funds for preservation. If you are an individual artist, you may consider a partnership with an university archive or other repository to do a preservation survey.

The American Institute for Conservation of Historic and Artistic Works (AIC) has published a pamphlet ["Selecting a Conservator"](#). They also administer a conservation services referral system through the publication FAIC [Guide to Conservation Services](#).

"Using Consultants in Film/Video Archives," by Alan Lewis in Footage 89: North American Film and Video Sources, New York: Prelinger Associates is also helpful.

A number of media arts organizations have undertaken preservation projects and could provide suggestions or guidance.

- [Andy Warhol Museum](#)
- [Anthology Film Archives](#)
- [The Jewish Museum Archive of Broadcasting](#)
- [Museum of Modern Art](#)
- [Video DataBank](#)
- [WGBH](#)
- [WNET Tape Archive](#)

Collaborative projects and networking with colleagues through such groups as Independent Media Arts Preservation (IMAP) or the AMIA listserv can also be useful.

Educate Yourself

See the section in "Video Preservation: The Basics" - Learning More About Electronic Media Preservation for on-line and print bibliographic resources, funding information and education.

Other resources of use are:

Boyle, Deirdre. Video Preservation: Securing the Future of the Past, NY: Media Alliance, 1993.

Lindner, Jim. [Videotape Restoration--Where Do I Start?](#) No date.

Murphy, William T. [Television and Video Preservation 1997](#), Washington, DC: Library of Congress, 1997. See the chapter "The Materials and their Preservation Needs" for a discussion on recommended temperature and humidity for tape. You may also order it from the [Library of Congress](#).

[Preserve, Inc.](#) publishes Dance Archives: a practical manual for documenting and preserving the ephemeral art. Chapters on General Preservation and Storage, Videotape and Film, Photographs, Documents on Paper, Oral and Video Histories, a Glossary of Archival Terms, a Bibliography, and a comprehensive list of Resources. Preserve, Inc. is a national, not-for-profit center that

serves as national clearinghouse for information about archival documentation and preservation of the performing arts.

Wheeler, Jim. [Videotape Preservation](#) Nov 1994.

Preservation Planning and Management

Scholtz, James C., Developing and Maintaining Video Collections in Libraries, Santa Barbara, CA [CLIR](#), 1989.

Preservation Planning and Management

- [Consultants](#)
- [Project Planning and Management](#)
- [Collection Assessment and Surveys](#)
- [Collection Management](#)
- [Appraisals](#)
- [Resources](#)

Consultants

Planning for your preservation program is complex, but there are many resources as well as professional consultants to guide you. There are also organizational models that may be relevant to your program; we encourage you to contact your colleagues in the field with active preservation programs. Whether you decide to develop your management plan within your organization or to contract with outside professionals, here are some issues to consider.

If you decide to contract for professional consultation for all or parts of your project, be sure you understand what specific services will be provided. The "Resources" section contains a representative a sampling of available consultants; the list is not exhaustive.

You may also wish to consider professional training for yourself or other members of your organization. There are formal educational programs as well as training activities offered by the professional preservation and conservation organizations. See "Learning More About Electronic Media Preservation" for these resources.

Project Planning and Management

Preservation project planning and development refers to the design and development of a comprehensive and on-going preservation program consistent with your organization's overall goals, activities, resources and structure. It may include such specific tasks as developing a work plan, budget, procedures, manuals, and a disaster and recovery plan.

Once your program is designed you must decide how and who will be responsible for managing it. Specific tasks here may include on-going guidance, management and implementation of the project.

If you have a special interest in library media collections, see [Developing and Maintaining Video Collections in Libraries](#), by James C. Scholtz. Santa Barbara, CA: [CLIO](#), 1989.

Collection Assessment and Surveys

An assessment of your collection is generally the first step. The survey will inform you about the materials you have, how they are presently stored and make recommendations about the types of actions you can take. It will help you set priorities for your program.

Collection Management

Collection management refers to the way your collection is organized and how you take care of it. Consultants in this area may look at the system you use for describing your collection, how you keep track of it, how it is stored, whether it is used and if so how is the work accessed, and what procedures you have in place for preservation.

See "Storage" for information about this critically important aspect of preservation. An environmental survey will provide you with detailed technical specifics of the physical environment in which your materials are stored, including temperature and humidity fluctuations, air quality, whether there are impurities and pollutants in the air which could damage your tapes, and what types of shelving you are currently using. Recommendations are based on the results of environmental monitoring of your storage facility.

Storage facilities consultation can help you decide about on-site or off-site storage, and with issues of design, construction and development of a management plan for a storage facility.

See "Cataloging" for a discussion of the system of arranging and describing the collection. Your present system should be evaluated and analyzed in terms of such issues as compatible cataloging, which will allow you to share information with other organizations.

To initiate and maintain your preservation program you will need to develop a long-term plan that identifies the resources you can commit to the project. If you decide to contract with outside professional consultants in this area, grant consultation services can provide assistance in identifying funding sources for preservation, in developing a project, and developing or reviewing funding proposals.

Appraisals

You may want or need to have your collection appraised; this is done by a professional who will provide you with a statement about the value and use of your collection.

Resources

The following consultants were listed in the [Magnetic Media Preservation Sourcebook](#) available from [Media Alliance](#). Listing here is provided as a service, is not a comprehensive survey of available consultants, and does not constitute an endorsement by Media Alliance or the Experimental Television Center.

[Developing and Maintaining Video Collections in Libraries](#), James C. Scholtz. Santa Barbara, CA: ABC-CLIO, 1989.

Boston Art Conservation

Boston Art Conservation is a partnership between a small group of professional conservators which provides conservation services for public and private clients throughout the United States. Consulting Services: Video preservation project planning and development; preservation project management; collection assessment/surveys. The Boston Art Conservation web site includes

abstracts and articles by conservators, and an extensive set of links to art conservation sites including such topics as digital video, preservation of digital media and video preservation.

Adrian Cosentini

Consulting Services: Audio collection assessment/surveys; collection management; preservation project planning and development; grant development/consultation.

Alan F Lewis

Consulting Services: Audio/video - collection assessment/surveys; preservation project planning and development - including proposal review; preservation training.

Behavioral Images, Inc.

Consulting Services: Appraisal - independent appraisal of all audiovisual recorded media, including video, audio, and motion pictures and related equipment.

Heritage Resource Management Associates

Consulting Services: Appraisal of audio, video and motion pictures; collection assessment/surveys; preservation project planning and development - including procedures/manuals, and disaster planning and recovery; preservation training; storage facilities planning and management. Also has acid deterioration detection and monitoring systems for acetate-based materials and nitrate-based materials.

Hollywood Vaults

Consulting Services: Video/audio - storage facilities consultation - including facilities design and construction management.

Image Permanence Institute

The Image Permanence Institute is a research laboratory at the Rochester Institute of Technology focused on the preservation of imaging and recording materials. They provide consulting services and technical resources which include evaluation of storage environments, study of the effect of temperature and humidity on recording media, determination of the influence of atmospheric pollutants on materials, and measurement of rates of temperature and humidity equilibration. The Institute publishes papers concerning laboratory studies on material behavior, including recommendations to collection managers.

Jim Hubbard

Consulting Services: Video and Film - cataloging; collection assessment/surveys; collection management

Museum Resource Consultants

Consulting Services: Audio/video - collection assessment/surveys; collection management; environmental surveys; preservation training.

Smolian Sound Preservation

Consulting Services: Audio - appraisal; preservation project planning and development - including disaster recovery.

Specs Brothers

Consulting Services: Audio/video - collection assessment; environmental surveys; disaster planning and recovery. Web site offers general info, FAQs, and tips on magnetic tape preservation, restoration, and disaster planning and recovery.

[VidiPax, Inc](#)

Consulting Services: Audio/video - collection assessment; collection management; cataloging. The web site includes articles and a video preservation links section. Links range from associations, organizations and professional groups to technical resources.

Preservation and Conservation Organizations - Profiles and Links

- [Archivists and Archiving](#)
- [Library Organizations](#)
- [Conservators and Conservation Practice](#)
- [Technical and Standards](#)
- [Information Services](#)
- [Audio Preservation](#)
- [Digital and Internet Preservation](#)
- [Listservs](#)

Archivists and Archiving

The media arts field has worked hard to participate in national and regional dialogues on preservation and to establish relationships with others involved with electronic media preservation. There are a number of different groups who are involved with preservation; the list below describes some of the key areas of work and organizations. For a more comprehensive list, see the [Magnetic Media Preservation Sourcebook](#), available from Media Alliance. The *Sourcebook* also describes in greater detail the working groups, task forces and other entities within these groups that focus specifically on the preservation of magnetic media.

Association of Moving Image Archivists

The Association of Moving Image Archivists (AMIA) is a non-profit professional association established to advance the field of moving image archiving by fostering cooperation among individuals concerned with the collection, preservation, exhibition and use of moving image materials. Through committees and interest groups, AMIA develops and promotes standards in the field, especially in the areas of moving image preservation, cataloging, and access. AMIA holds an annual conference, conducts workshops to help train new moving image archivists, and periodically coordinates advanced technical symposia. AMIA publishes the quarterly AMIA Newsletter, and provides other publications and mailings of interest to the moving image archive field.

The Moving Image: Journal of the Association of Moving Image, a professional journal, provides an open forum for archivists, librarians, technical specialists, scholars and academics. The AMIA Newsletter serves as a news forum; Moving Images offers in-depth articles concerning historic and contemporary film, television, and video, new and emerging digital technologies, as well as paper and three-dimensional collections documenting the history of moving image media. AMIA also administers a listserv, AMIA-L (see Appendices). Web resources include detailed information about the scholarship programs, downloadable applications for the scholarship programs, and an extensive section of links - "Film and Video Resources on the Internet."

Society of American Archivists

The Society of American Archivists serves the educational and informational needs of its members and provides leadership to help ensure the identification, preservation, and use of the nation's historical record. SAA distributes more than 120 books and publications of specific interest to archivists, as well as publishing its own series of books, pamphlets, and manuals. In addition, SAA publishes several periodicals: The American Archivist, covering trends and issues in archival theory and practice and Archival Outlook (bimonthly). SAA Membership Directory

and the SAA Directory of Archival Education in the United States and Canada. SAA has regional chapters and conferences which are an excellent way to network with their members. They are open to learning about independent media arts collections and efforts to preserve these collections, and are increasingly concerned with issues surrounding moving image and sound preservation.

Library Organizations

The American Library Association

ALA is the national organization of librarians. The Video Roundtable of the ALA is broad-based group bringing together ALA members who have an interest in and/or responsibility for video collections. The Roundtable provides a unified voice for video advocacy in the areas of legislation, professional guidelines for collections, and other issues specifically related to video and libraries. They also educate library professionals about the use of video, and provide a liaison between video vendors and the library sector. The Video Roundtable publishes Video Round Table News on a quarterly basis.

The ALCTS/PARS Photographic and Recording Media: Methods, Materials, and Standards Committee is charged with coordinating section activities related to the methods, materials, and standards employed in the preservation of photographic and recording media.

Council on Library and Information Services

CLIR is the result of the 1997 merger of the Commission on Preservation and Access and the Council on Library Resources. CLIR is a non-profit organization governed by an independent board, and its primary activities include identifying critical issues facing libraries and archives, convening individuals and organizations to engage and respond to these issues, and coordinating national and international programs in preservation and access, digital libraries, economics of information, and leadership development. CLIR maintains four current programs: the Commission on Preservation and Access, Digital Libraries, the Economics of Information, and Leadership. CLIR's Commission on Preservation and Access (CPA) is sponsored in part by libraries, archives, colleges, universities, publishers, and other allies concerned with preservation and access issues. One project of the Preservation Science Research Initiative, a program of CLIR, was the development of a joint report from the Commission and the National Media Laboratory on the long-term storage requirements for magnetic media. *Magnetic Tape Storage and Handling: A Guide for Libraries and Archives*, by John Van Bogart, also provides guidance on how to care for these media to maximize their life expectancies. The CLIR web site also includes abstracts and ordering information on an extensive list of publications, including the report above and the Image Permanence Institute report *New Tools for Preservation: Assessing Long-Term Environmental Effects on Library and Archives Collections*, by James M. Reilly, Douglas W. Nishimura and Edward Zinn.

Library of Congress

In 1997, the LOC published *[Television and Video Preservation 1997: A Study of the Current State of American Television and Video Preservation](#)*. The report has two key objectives: to provide a factual foundation for the understanding of issues confronting the preservation of American television and video, and to recommend a national plan of action based upon a broad consensus of the archival community. Order information at the Library of Congress site. Motion Picture, Broadcasting and Recorded Sound Division (M/B/RS) has responsibility for the

acquisition, cataloging and preservation of the motion picture and television collections. The Division operates the Motion Picture and Television Reading Room to provide access and information services to an international community of film and television professionals, archivists, scholars and researchers. The LOC web site is organized into sections representing the research and reference services for Motion Picture and for Recorded Sound. In the "Collections Care and Conservation" section of the [Motion Picture Reading Room](#) there is a link to a bibliography by Mark Roosa covering magnetic media preservation. A bibliography on audio preservation, and the article "Record and Tape Care in a Nutshell" are part of the Recorded Sound Reading Room section, along with information resources on cylinder recordings.

Research Library Group

RLG is devoted to improving access to information which supports research and learning. It is an alliance of universities, colleges, national libraries, archives and independent research collections.

The goal of RLG Working Group on Preserving Magnetic Media is to compile and present a set of practical guidelines to assist libraries and archives in preserving these collections. Objectives of the working group include:

- organizing and analyzing the available research and knowledge on preservation and reformatting requirements of magnetic media;
- developing documentation of relevant standards and best practices, including guidelines for storage, care and handling, reformatting, and transfer re-recording;
- recommending steps RLG and its members can take to disseminate information that will result in the most effective and timely distribution of information;
- developing model RFPs, including technical specifications, for reformatting or transfer re-recording of magnetic media formats;
- investigating cost and quality (better environmental monitoring, etc.) benefits associated with establishing a shared storage facility for magnetic media.

In the 1997-98 grant cycle, the Research Libraries Group was funded by the National Academy of Recording Arts and Sciences to create and make available a single, comprehensive information source that includes the best practices and relevant technical standards for the preservation of magnetic media. The resulting manual will be available via the Internet on the RLG PRESERV web site. For information on working group membership, consult [RGL PRESERV](#).

Conservators and Conservation Practice

American Institute for Conservation of Historic and Artistic Works

AIC is the non-profit national membership organization of conservation professionals dedicated to preserving the art and historic artifacts of our cultural heritage for future generations. AIC holds an annual conference and has several publications including the Journal of the American Institute for Conservation; AIC News; Membership Directory; and books, pamphlets, and audiovisual materials on conservation subjects. The AIC web site includes sections "Selecting a Conservator" and "Caring for Your Home Videotape".

[Electronic Special Interest Group of AIC](#)

EMSIG was formed in 1997 to promote a better understanding of the preservation issues relating to electronic media, enabling conservators can actively contribute to this area of conservation.

[Conservation OnLine](#): Resources for the Conservation Professional

CoOL is a project of the Preservation Department of Stanford University. CoOL has extensive online conservation and preservation information and encourages contributions from visitors. Conservation DistList is a discussion group of CoOL intended for those professionally involved with conservation of museum, library or archive materials.

Technical and Standards

[American National Standards Institute](#)

The American National Standards Institute (ANSI) serves as an administrator and coordinator of the United States private sector voluntary standardization system. Founded in 1918 by five engineering societies and three government agencies, the Institute remains a private, non-profit membership organization supported by a diverse constituency of private and public sector organizations. The Institute represents the interests of its nearly 1,400 company, organization, government agency, institutional and international members. ANSI facilitates development of American National Standards by establishing consensus among qualified groups. The web site includes a searchable database of standards documents, and an extensive "Library" section that explains the standards development process.

Image Permanence Institute Rochester, NY

Rochester Institute Of Technology, College Of Imaging Arts and Sciences, Image Permanence Institute, (716) 475-5199, Rochester, NY 14604

The Image Permanence Institute is a research laboratory at the Rochester Institute of Technology focused on the preservation of imaging and recording materials. There are nine scientists providing consulting services and technical resources for clients which include libraries, archives, manufacturers of recording materials and manufacturers of enclosure materials. The Image Permanence Institute publishes 4-5 papers a year based on laboratory studies on material behavior, including recommendations to collection managers.

[The National Media Lab](#)

The National Media Laboratory (NML) Strategic Alliance was created to bring commercial information technology expertise to the U.S. government for the tasks of collecting, exploiting, disseminating and archiving data. Through the National Technology Alliance (NTA), a partnership between government, industry and academia, information technologies developed in the commercial world are leveraged for the benefit of government users. Currently, the NTA is comprised of three national labs. The National Media Laboratory (NML) is one of these labs and is hosted by the 3M Company. NML strives to provide and facilitate forums in which data storage issues may be discussed. NML's publications, NML Reviews, NML Bits Newsletter, and Technical Briefings, are intended to introduce and develop ideas and foster networking opportunities between these groups. The National Technology Alliance Online provides access to the National Media Lab's [Media Stability Technical Reports](#). Also available is Guidelines for the Storage and Handling of Recorded Information, Information on Storage Media Longevities, Damage and Disaster Recovery and links to other information. Materials can also be accessed through [National Technology Alliance](#).

Society of Motion Picture and Television Engineers

The Society of Motion Picture and Television Engineers (SMPTE) is an international technical society devoted to advancing the theory and application of motion-imaging technology including film, television, video, computer imaging, and telecommunications. Members are practitioners from almost every discipline in the motion-imaging industry. SMPTE develops standards and recommended practices and engineering guidelines, created by study groups. SMPTE also organizes annual conferences and publishes the *SMPTE Journal*, containing technical papers, tutorials, articles, standards updates, and reports on SMPTE Sections' activities.

WGBH Universal Preservation Format Initiative

This project advocates for a format for the long-term storage of electronically generated media. The concept of a universal preservation format is to store the media in such a way that the information could be retrieved regardless of the medium or the computer operating system used. The goal is to make the process of preserving and accessing electronic records, both original and migrated (those existing previously in another format, like video) more efficient, cost-effective, and simpler. The Recommended Practice document, developed through a Study Group of the Society of Motion Picture and Television Engineers, will suggest guidelines for engineers when designing computer applications that involve or interact with digital storage. The Universal Preservation Format web site contains an extensive list of news and reports, presentations and background information relating to the development of the project and the concept. A listserv has also been set up at UPF@info.wgbh.org.

Information Services

Independent Media Arts Preservation

IMAP is a consortium of professionals working to preserve and advocate for independent media preservation, IMAP is a key resource on the care and preservation of older media formats and provides information and referral on such issues as collection management, cataloguing and remastering. IMAP's primary interest is to support the preservation of works reflecting the early history of independent media. IMAP focuses on the preservation of non-commercial productions such as video art, audio art, and technology-based installation art; independent documentary and narratives; community media; and documentation of arts and culture. IMAP was formed to continue the leadership formerly undertaken by the New York-based organization Media Alliance.

The International Association for Media and History

The International Association for Media and History is a group of professional film and television broadcasters, scholars, and others who are concerned about film, radio, television and their relations to history. Activities include conferences, a journal, *The Historical Journal of Film, Radio, and Television*, an E-mail forum, and critically evaluated links to related websites.

The International Federation of Television Archives

FIAT/IFTA is a non-profit association of television archives organized in 1977 to encourage cooperation among members, and to promote the compatibility of audio-visual documentation systems as well as documentation exchange. FIAT holds periodic conferences and publishes a newsletter, available in full on the web site. Also included on the web site is information

about FIAT/IFTA Handbook Recommended Standards and Procedures for Selection and Preservation of Television Programme Material.

Media Alliance

Founded in 1979, Media Alliance is an advocacy and service organization dedicated to advancing the independent media arts. Media Alliance provides media arts information and referral, publishes a bi-monthly newsletter, *Media Matters*, and convenes members for workshops, conferences and working groups on pressing issues. Media Alliance also provides funding to rural media groups through the Media Action Grant. In 1991, Media Alliance and the New York State Council on the Arts conducted a national survey of video art collections, and organized the first conference on video preservation for media arts organizations the same year. Since that time Media Alliance has served as an information clearinghouse on video preservation for the media arts field. Since 1991, Media Alliance has provided the media arts field with comprehensive information and technical assistance on all aspects of preservation, and is nationally recognized for its collaborative projects, including a Regional Cataloging Project coordinated by cataloger Jim Hubbard, and a series of preservation surveys conducted by conservator Paul Messier. In recent years, Media Alliance also published *[Video Preservation: Securing the Future of the Past](#)*, by Deirdre Boyle, and the *[Magnetic Media Preservation Sourcebook](#)*, edited by Mona Jimenez and Liss Platt

Archivists Round Table of Metropolitan New York, Inc.

Founded in 1979, the Archivists Round Table of Metropolitan New York, Inc. (ART) is a not-for-profit organization representing a diverse group of more than 330 archivists, librarians, and records managers in the New York metropolitan area. It is one of the largest local organizations of its kind in the United States with members representing more than 160 repositories.

The Regional Alliance for Preservation (RAP)

RAP was began in February 1997 as a pilot project of the Commission on Preservation and Access (Washington, DC) to foster cooperation among the Preservation Field Service programs funded by the National Endowment for the Humanities. When pilot-project funding ended in February 1998, participants decided to continue RAP as a cooperative program, and in October of that year, the alliance expanded to include members of the Association of Regional Conservation Centers (ARCC). Initial funding enabled RAP to begin publishing an occasional newsletter. The Institute for Museum and Library Services has funded the development of this Web site.

Audio Preservation

Association for Recorded Sound Collections

ARSC is a non-profit organization whose main purpose is to develop and disseminate information related to all fields of recording and sound media. ARSC works for the preservation of historical sound recordings, promotes the exchange of information, and fosters an awareness of the importance of recorded sound in our culture. ARSC also provides a forum for the development and dissemination of discographic information in all fields and periods of recording and in the sound media. ARSC holds an annual conference. The ARSC Journal reports on major research, technical developments, discographies, record and book reviews, and includes a current bibliography of related articles in other publications. Associated Audio Archives Committee is devoted to the dissemination of information of interest to sound archives in institutions,

including issues of audio preservation and all aspects of sound archive administration. ARSC sponsors an Internet discussion list to facilitate the exchange of information on sound archives and promote communication among those interested in preserving, documenting, and making accessible the history of recorded sound. Messages are archived. The list is hosted by The Eastman School of Music of the University of Rochester.

[Audio Engineering Society](#)

The Audio Engineering Society (AES) is the only professional society devoted exclusively to audio technology, serving its members, the industry and the public by stimulating and facilitating advances in the field of audio. SC-03 Subcommittee on the Preservation and Restoration of Audio Recording

The scope of the AES committee includes test methods, practices, and specifications pertaining to the life expectancy and retrieval of audio information recorded on mechanical, optical and magnetic systems, including their respective media.

[International Association of Sound Archives](#)

IASA is a non-governmental organization affiliated with UNESCO. IASA supports the professional exchange of information and fosters international cooperation between audiovisual archives in all fields, especially in the areas of acquisition and exchange, documentation, access and exploitation, copyright, and conservation and preservation. IASA Committees include Technical, Cataloguing, Documentation, Discography, National Archives, Training, and Radio Sound Archives.

[Digital and Internet Preservation](#)

[Commission of Preservation and Access at CLIR](#)

The Commission is sponsored in part by libraries, archives, colleges, universities, and others concerned with preservation. Among CLIR's priorities is studying ways to insure preservation and accessing of digital information

[International Research on Permanent Authentic Records in Electronic Systems](#)

InterPARES is part of the world's archival community dedicated to researching the long-term preservation of records created in electronic systems. The site has resources area with reports, glossary and related sites.

[Internet Archive](#)

This organization is collecting and storing public materials from the Internet such as the World Wide Web, Netnews, and downloadable software. The Archive will provide historians, researchers, scholars, and others access to this vast collection of data and ensure the longevity of this information.

Tracking Information Online:

[The Digital Object Identifier](#) is a system for identifying and tracking objects on the Internet. [Digital Object Identifiers: Promise and Problems for Scholarly Publishing](#) (The Journal of Electronic Publishing, Volume 4, Issue 2, March, 1999. Additional information can be found at [FileOpen Systems](#).

WGBH Universal Preservation Format Initiative

This project advocates for a format for the long-term storage of electronically generated media so it can be retrieved regardless of the medium or the computer operating system used. The web site contains extensive information. A listserv has also been set up.

Listservs

AV Media Matters was formed in 1999 and focuses primarily on technical issues. To subscribe, send an email to AV-Media-Matters-subscribe@topica.com.

AMIA-L is AMIA's listserv, a great way to learn about preservation and to ask questions to a wide range of experts around the world. The listserv is archived.

Archive-L is a listserv initiated by members of the Society for Cinema Studies and the Association of Moving Image Archivists interested in the intersection of concerns, perspectives, and endeavors shared by archivists and academics in the moving image field. To subscribe to Archive-L, send the following message to maiser@tcf.ua.edu: subscribe Archive-L.

Conservation OnLine Conservation DistList is a discussion group of CoOL intended for those professionally involved with conservation of museum, library or archive materials.

Care and Handling of Tape

- [General Guidelines](#)
- [Further Reading](#)
- [Sources for Supplies and Materials](#)

General Guidelines

Proper care and handling of tapes can significantly prolong the shelf life and prevent common problems like sticky shed, mold and drop out. Here are general guidelines. For unfamiliar terms see sections on "Preservation Terms" or "Video Terms".

- Don't stack the tapes horizontally
- Tapes should be kept upright, supported by the hub. When stacked or stored horizontally, tapes develop uneven wind, resulting in instability during playback.
- Avoid temperature and humidity fluctuations
- For more detail see section on "Storage". Keep tapes out of car trunks, glove compartments, and direct sun.
- Be careful with tapes and equipment exposed to extremes of temperature
- If exposed to either extreme heat or cold, allow tapes and recording and playback equipment to come to the ambient room temperature and humidity before you use them.
- Protect the tape against accidental erasure.
- Remove the record tabs on the tapes to prevent accidental re-recording over original material.
- Avoid contamination of tape surface
- Handle the tape itself as little as possible to avoid contamination with oils from skin. Touch open reel tapes by the beginning and end only. Wash your hands and use gloves.
- Avoid exposure to magnetic fields
- While exposure must be fairly direct to cause problems, it is best to avoid exposure. Don't leave or store tapes near magnetic fields created by motors, generators, television sets, elevator installations, headphones, speakers, microphones, airport security scanning systems, or magnets of any sort.
- Use calibrated equipment and proper rewinding
- After use, rewind the tape to the end; don't store a tape that is stopped in the middle. It is often recommended that tapes should be periodically re-wound or repacked (open reel), but only on properly maintained and aligned equipment. Rewinding means you fast-forward the tape all the way to the end, and then rewind all the way to the end. This will hopefully minimize uneven wind, stretching, etc. You can consider a regular schedule of rewinding if it can be done on good equipment. If done on old machines, it can cause additional damage and is also labor-intensive.
- Use high quality, brand name tapes for copying and remastering
- Use high quality, brand name tapes for production, viewing copies and preservation copies. There is no archival format for tape at the present time, so eventually the tape will need to be remastered. The original tape must be of sufficient quality to hold up during the transfer process. Label minimally and with proper materials
- Use archival labels which are non-acid, and which adhere without peeling off, attracting dust or debris and spreading adhesive. Use the label only to provide pertinent

information. For archival labels and other materials, see the Resources, Supplies and Materials section.

- Tape hubs should be as large in diameter as possible to prevent tape distortions.
- Use appropriate tape containers
- Tape containers should be strong and stable (not able to be bent) and resistant to dirt, dust and water. Use an inert tape container, not paper or cardboard. The container should be able to be closed and latched securely. If you enclose any other materials in the container, they should be clean, archivally stable material such as acid-free papers, and materials that are non-magnetic, and non-flammable.
- Ship tapes with proper protection
- If you ship tapes, be sure they are double-boxed, with space between tape cases and exterior boxes. Use safe packaging materials; never use fiber-filled mailers. They create dust, which gets inside the tape housing and on to everything else in the environment. If you enclose any other materials they should be clean, and archivally stable material.

Further Reading

Fifer, Sally Jo, Tamara Gould, Luke Hones, Debbie Hess Norris, Paige Ramey and Karen Weiner (eds.). *Playback: A Preservation Primer for Video*. San Francisco: Bay Area Video Coalition, 1998.

Lindner, Jim. [*The Proper Care and Feeding of Videotape*](#) NY, VidiPax

Murphy, William T. [*Television and Video Preservation*](#) 1997. Library of Congress, 1997. See the chapter "The Materials and their Preservation Needs" for a discussion on the care and handling of magnetic tape. You may order the Study from the [Library of Congress](#).

Norris, Debbie Hess. [*Caring for Your Home Videotape*](#)

A publication of the American Institute for Conservation of Historic and Artistic Works (AIC).

Van Bogart, John. [*Magnetic Tape Storage and Handling: A Guide for Libraries and Archives*](#). Provides guidance on how to care for these media to maximize their life expectancies. The paper was a joint project of the Council on Library and Information Services (CLIR), Commission on Preservation and Access, and National Media Lab.

Wheeler, Jim. [*The Dos and Don'ts of Videotape Care*](#).

Sources for Supplies and Materials

Light Works

archival storage, display and presentation materials for negatives, transparencies, CD's, photographs, artwork and documents. Catalog available.

Conservation Online

environmental control and monitoring information

Conservation Resources International

Archival audio and video tape cassette storage boxes.

[G.M. Wylie Company](#)

Archival audio, video, and CD storage boxes.

King Video Associates, Inc. Springfield, VA

Repair and parts for all broadcast and industrial radio and television equipment, including 2" quad and other obsolete formats

Metal Edge, Inc.

Archival audio, video, CD, microfilm microfiche, and phonograph storage boxes

[SOLINET Preservation Services](#)

list includes companies that provide supplies, equipment, and services

[Trak-R Logger](#)

Sales and rental of data loggers for monitoring temperature and relative humidity

[University Products, Inc.](#)

Archival audio and video tape cassette storage boxes

Storage Guidelines

- [Storage Guidelines](#)
- [Resources on Storage - Publications and Sites](#)

Storage Guidelines

These are general guidelines to improve short-term storage conditions for your tapes. If you plan long-term storage, and are rehabilitating an existing storage area or building a new one, you will need to do more research and might want to consider outside consultants. If you are investigating off-site storage, additional research will help you to evaluate your needs and the prospective sites. See the Resources section for suggestions.

Temperature and Humidity

Tapes should be kept in a cool, relatively dry environment. For access storage, which means you are taking tapes in and out of storage on a regular basis, the recommended range for temperature is 60 - 73°F and a relative humidity of between 20 - 30%. If you are storing at the lower end of the temperature range, the humidity can be at the higher end. If you store at the higher temperature, the humidity should be at the lower end of the range. For example, 68°F at 25% RH would be within range.

Storage guidelines for access storage should help keep tapes in a useable state for ten years. Archival storage recommends lower temperatures that will give tapes a longer shelf life and will drastically minimize further deterioration in older tapes. See Resources section for more information on long-term storage. Avoid temperature and humidity fluctuations; a range of no more than 7°F is recommended. For fluctuations in relative humidity, recommendations vary from fluctuations of no more than 5% RH to fluctuations of no more than 20% RH.

Allow tapes and any equipment used with them to come to the ambient room temperature and humidity before you play them. High humidity and temperatures can cause binder and mold growth. Thus, the lower your relative humidity the better; however very low humidity can create static which attracts dirt. See Dr. Peter Adelstein's article "Videotape Storage" in *Playback: A Preservation Primer for Video* in the Resources section.

Monitor the Storage Environment

Invest in a device to monitor the temperature and humidity, and set up a regular schedule for logging the information.

The Storage Room

It's preferable to have a room dedicated to storage because the environment is easier to control. Don't store tapes in areas that are subject to unexpected or uncontrolled extremes of temperature or humidity; avoid attics, areas near heating, plumbing or sprinkler systems, or lower floors, which may be prone to flooding. A windowless room is preferred; if your storage area has windows, be sure the tapes are not stored in direct sunlight. The room should be as free of dust as possible and easy to keep clean, without carpets, fabrics or exposed insulation. Allow no smoking, eating or drinking. Choose a well-insulated room with good air circulation; if possible air should be filtered. Room lights should be kept off when the room is not in use.

Shelving

Store tapes on metal shelves; it is best if they are grounded. Wood isn't recommended because it is a fire hazard, can emit gases and has a tendency to hold moisture and provide a medium for fungus growth which will damage magnetic media. If the metal shelving has been used, check to be sure that magnetic book ends weren't used because they can magnetize the shelves. If the shelving is motorized, be sure that tapes are stored away from close contact with the motors because they are a source of magnetic fields. Be aware of static discharges with metal shelves if the environment is very dry; generally these discharges probably won't damage the magnetic material.

Store Tapes Upright

Store tapes vertically, in an upright position, supported by the hub. They should not be stored horizontally, laying flat on the side. Allow for air circulation around shelving.

Avoid Magnetic Fields

Damage is usually caused by direct exposure, exposure for long periods of time, and exposure to strong fields. It is best to avoid exposure. Don't leave or store tapes near magnetic fields created by motors, generators, television sets, elevator installations, headphones, speakers, microphones, airport security scanning systems, or magnets of any sort.

Separate Your Tapes

In an ideal situation, duplicate tapes and high quality masters would be stored in different locations, or at least in two different parts of a building. In case of fire, flood or similar catastrophes, you may not lose all existing copies of a tape.

Labels, Containers and Winding

See the section on "Care and Handling".

Resources on Storage - Publications and Sites

Publications

Fifer, Sally Jo, Tamara Gould, Luke Hones, Debbie Hess Norris, Paige Ramey and Karen Weiner. (eds.) *Playback: A Preservation Primer for Video*, San Francisco: [Bay Area Video Coalition](#), 1998.

Murphy, William T. [Television and Video Preservation](#) 1997, Washington, DC: Library of Congress, 1997. See the chapter "The Materials and their Preservation Needs" for a discussion on recommended temperature and humidity for tape. You can order the study from the Library of Congress.

Reilly, James M., Douglas W. Nishimura and Edward Zinn. [New Tools for Preservation: Assessing Long-Term Environmental Effects on Library and Archives Collections](#).

[SMPTE RP 103-1995 - Tape Care, Handling, Storage](#)

[SMPTE RP 190-1996 - Care and Preservation of Audio Magnetic Recordings](#).

Van Bogart, John. [Magnetic Tape Storage and Handling: A Guide for Libraries and Archives](#). Provides guidance on how to care for these media to maximize their life expectancies. The paper was a joint project of the Council on Library and Information Services (CLIR), Commission on Preservation and Access, and National Media Lab, and is available at NML site. The report also contains links, a glossary, a bibliography and the Ampex Guide to the Care and

Handling of Magnetic Tape.

Vitiello, Stephen, and Leanne Mella. "[Facilities for Cleaning, Restoring, and Remastering Videotape](#)." The Independent (October 1991).

Wheeler, Jim. "Videotape Storage: How to Make Your Videotapes Last for Decades...or Centuries." American Cinematographer, 64:1 (January 1983).

Wheeler, Jim: "Long Term Storage of Video Tape." [SMPTE](#) Journal (June 1983).

Sites

[American National Standards Institute](#) (ANSI)

The ANSI web site includes a searchable database of standards documents. An example of an ANSI standard is ANSI/PIMA IT9.23-1998: Imaging Materials - Polyester Base Magnetic Tape - Storage

[Council on Library and Information Services](#) (CLIR)

The web site includes abstracts and ordering information on an extensive list of publications
National Media Lab

National Technology Alliance Online provides access to the [National Media Lab's Media StabilityTechnical Reports](#). Included is a report "Storage and Handling of Recorded Information

[Society of Motion Picture and Television Engineers](#)

SMPTE is engaged in the development of standards and practices and engineering guidelines, serving all branches of motion-imaging including film, video, and multimedia.

RP 103-1995 - Tape Care, Handling, Storage

RP 190-1996 - Care and Preservation of Audio Magnetic Recordings.

[Southeastern Library Network, Inc.](#)

Solinet is a not-for-profit library cooperative for the southeastern United States and the Caribbean. As part of the section [Related Internet Resources](#) there are many links to such topics relating to environments and buildings, such as pest control, carpets and mold.

Cataloging

- [Importance of Compatible Cataloging](#)
- [History of the IMAP Cataloging Project](#)
- [The Online Cataloging Tutorial](#)
- [Further Resources](#)

Importance of Compatible Cataloging

Cataloging is an essential first step to preservation. It allows us first to know accurately what we have, to establish the value of the holdings and to prioritize preservation work.

Those who support preservation activities are very concerned about providing access to collections they support. Intellectual access to media arts collections is extremely limited. There is often no compatible electronic information system in place that is easily accessed and allows users to share information about holdings. Many groups have no comprehensive paper records, coordinated paper catalogs, union lists, paper indexes or any other useful finding aids to allow researchers, programmers, educators, or other interested parties access to their collections.

Access to the works themselves is also limited. Many of the tapes cannot be played back at this time. Until the tapes are identified and prioritized in importance, an organization can't make sensible decisions about which need to be preserved.

Using a compatible electronic cataloging system would help groups with tape collections to:

- share information about holdings, fostering coordination on physical preservation of works that are at greatest risk
- make use of existing cataloged information about a particular holding
- facilitate access to the work by identifying the location of a particular work, the type of access offered by the archive, and to whom.
- determine whether a particular work is original and unique, and prioritize works most in need of preservation
- describe their holdings, and generate outside support for preservation activities
- facilitate the deposit of works at risk in other, more stable, environments

Standardized union catalogs exist in public libraries, museums and other institutions, but they have been designed for books and objects, rather than moving image or sound works. MARC or machine-readable cataloging is a standardized system set up by the Library of Congress and used nationally. It presents problems when it is used with film, video, audiotapes, CDs and new media works. The National Moving Image Database or NAMID project, a program of the American Film Institute's National Center for Film and Video Preservation, advocates a union system designed specifically for film and video. The goal is to encourage all film and video collections to use this single compatible computerized MARC-compatible database to catalog holdings. The information from each contributing archive could be put into one on-line catalog of holdings, which would be searchable on the Internet.

History of the IMAP Cataloging Project

The media arts field has been successful in developing a national model for establishing a compatible information system for moving image collections across a broad geographic region. [Independent Media Arts Preservation](#) (IMAP) is distributing a MARC-compatible cataloging template that was developed by cataloger Jim Hubbard, as part of the Regional Cataloging Project of Media Alliance. Henry Mattoon of the National Moving Image Database (NAMID) at the American Film Institute bases the template upon a design; former NAMID Director Margaret Byrne initiated the design. In the early 1990's, NAMID assisted a number of media arts groups to do initial catalogs, including Video Data Bank, Electronic Arts Intermix, Anthology Film Archives, the Experimental TV Center and the Kitchen.

Further distribution of the template was carried on by Media Alliance, providing training and technical assistance to groups in upstate New York, with NAMID's assistance. This work is now being continued through the IMAP Cataloging Project, and the scope of the work is being expanded through an online component. For a copy of the template contact IMAP

The template can be used by people without cataloging experiences but who have some familiarity with computer databases. FileMaker Pro is easy to use and operates on both Macintosh and IBM platforms. The data captured in the FileMaker Pro template can be exported to other databases. The template is in use by the Kitchen, the Experimental TV Center, Visual Studies Workshop, Hallwalls Contemporary Arts Center, Paper Tiger Television, and Downtown Community Television Center, and is regularly requested by artists and organizations nationwide.

The Online Cataloging Tutorial

With assistance from a Technology Planning Grant offered by the New York Foundation for the Arts and the New York State Council on the Arts, IMAP conducted a planning and feasibility study for an online tutorial using the template described above. The online tutorial is designed to assist groups and artists to do preliminary cataloging based on a standardized template and to become part of the larger network of archives. The tutorial will use a downloadable template, and will include FAQ's and other teaching aids. The tutorial lays foundation for a more long-term goal, the establishment of a web-based searchable database

While IMAP recognizes that an online tutorial cannot take the place of professional cataloging, most groups will devise a cataloging system of their own because they need to generate lists of titles in their collections. These systems often rely on a variety of word processing and database programs with no relationship to standard cataloging processes and procedures. They are frequently incompatible with other database systems. Often if a professional cataloger is brought in, the system is scrapped and the cataloging work begins again with a new template. The IMAP template provides a standard set of fields, and a standard way of entering data into the fields.

Cataloging is usually done in stages. The stages range from an inventory level record which includes the title, name of maker and other information easily obtained from labels on the work and its container, to a full MARC record which requires viewing of the tape and completing Name and Subject Authority work. The cataloger also has the choice of a collection level record which describes a related group of works in a single record, or an item level record which

describes each work in its own record. Through the tutorial, IMAP encourages the use of item level cataloging because it is more useful for research and preservation decision-making. The template is distributed with a set of instructions that explain each field and provides illustrative examples.

The research and planning for the tutorial have addressed many important questions. Two reports were written, one by Jim Hubbard and one by C.B. Cooke of Glyph Media. Contact IMAP for copies of the reports. Planning for the implementation of the cataloging tutorial is on-going.

Further Resources

[Archival Moving Image Materials: A Cataloging Manual](#) Revisions to Archival Moving Image Materials: A Cataloging Manual. Compiled by Wendy White-Henson. Washington, DC: Library of Congress, Motion Picture, Broadcasting and Recorded Sound Division, 1984.

[AMIA Cataloging and Documentation Committee](#)

Extensive information and links

[AMIA Compendium of Moving Image Cataloging Practice](#)

[National Moving Image Database at the American Film Institute](#)

NAMID serves as a working tool to make informed decisions about the preservation of moving image materials; facilitates shared cataloging; and increases access to primary research materials on moving images. NAMID collects film/videographic and holdings data from archives, producers, studios, networks, libraries and other repositories across the United States. The NAMID database houses more than 200,000 records (over 160,000 of which are in USMARC), contributed by over two dozen archives. The database structure, which is modular, was designed to serve a wide variety of users, including public archives, studios, media centers, historians, researchers and catalogers. As part of NAMID's effort to facilitate the creation of a comprehensive source of information on the nation's film and video materials, NAMID is actively engaged in the establishment and promulgation of national standards and practice for the documentation and preservation of moving images.

Cleaning, Remastering and Restoration

- [A Review of the Issues](#)
- [Non-profit Centers](#)
- [Commercial Facilities](#)
- [Further Reading](#)

A Review of the Issues

Cleaning

As it became apparent that older videotapes were deteriorating and becoming difficult to play, concerned people in the media arts field started investigating cleaning and re-mastering; early experimenters included Bob Harris at Anthology Film Archives, Tony Conrad at Media Study/Buffalo, Ralph Hocking at the Experimental Television Center, videomaker David Schulman, and staff at Electronic Arts Intermix. See Further Reading for related articles.

There is considerable discussion surrounding methods of cleaning, particularly in relation to open reel tapes. It's accurate to say that methods of cleaning are still evolving. Scraping with a blade, wiping, vacuuming, baking are all methods that are used to clean open reel tapes, depending on the problem. There is much debate within the field about the advantages and disadvantages of each method.

It's important to remember that not all tapes need to be cleaned, and the method of cleaning will depend upon the problem. For cassette tapes, there are cleaning machines, called RTI machines, which are readily available. If you plan to tackle the cleaning yourself, do some research, so you can diagnose the problem and treat it accordingly. [The Bay Area Video Coalition](#) is a good source for non-proprietary information on cleaning methods; if you are using a vendor, inquire as to inspection and evaluation procedures, how they conclude that cleaning is needed and which cleaning methods they use.

Choosing a Format

Which format will you choose when you transfer your old tapes? Many people are now recommending transfer to an uncompressed digital format such as D-2 and an analog format such as Betacam SP. There are a number of reasons for this. From a preservation perspective you want to preserve all of the information with as few changes as possible. A compressed format means a loss of information, and thus a change in the original work. For artists invested in the unique characteristics of analog imaging, the transfer to digital format may cause unacceptable changes in the original images. On the other hand, if you are concerned primarily with the content of a tape, you may accept an alteration in the image because your priority is access to the information - both through traditional and online means.

Another issue you need to consider when choosing a preservation format is the likelihood that the format itself will survive in the marketplace and remain in use for a prolonged period. Because built-in obsolescence is a factor in manufacturing and marketing, not all hardware has an equally likely chance of long-term survival. It can be expensive to have to again transfer tapes to a different format because they exist on a format that is no longer being made or supported by the industry. Betacam SP is a preferred analog choice; because it is so widely used in the broadcast industry, the format is unlikely to be discontinued. This means that repair and replacement of equipment are likely to be available later.

You also need to analyze the format in relation to the kinds of equipment you have. What hardware are you currently using to offer access to screen or study works, to distribute, or to broadcast? Ideally you will make two preservation masters, each one stored in different locations; these would not be touched except to create new sub-masters. Viewing dubs would be made from the sub-masters, and it is these tapes that are actually used. However, this is often not possible for an organization, so you need to consider what hardware you have available in your institution or region.

Talk with people who have had tapes cleaned or re-mastered to get their recommendations on facilities. Ask whether they have done the work in-house, used a non-profit production facility like the [Bay Area Video Coalition](#) or a commercial house like [VidiPax](#). [Electronic Arts Intermix](#) has a strong preservation program that began in the 1980s and can share their experience and decision-making process.

You might want to consider saving your hardware and software, whether it works or not. If you decide to do this, you should also save manuals, schematics, and training materials, as well as contact information for engineers and inventors who have worked on older equipment.

"Reel to Real: A Case Study of BAVC's Remastering Facility", by Luke Hones, edited by Sherry Miller Hocking and Monda Jimenez, is available in the Preservation area of the Experimental Television Center's Video History site.

Many businesses that do re-mastering now describe themselves as also doing inspection and evaluation, cleaning, restoration, re-mastering and sometimes audio or video "correction" or "enhancement". See "Preservation Terms". Some businesses focus more on disaster recovery from fires, floods and the like, while others are best equipped for routine problems such as dirt, humidity and drop-out. Some perform both in-house cleaning and re-mastering, but others may send one of those tasks to another facility. Be sure to ask for and check references, and inquire about their processes.

Non-profit Centers

Bay Area Video Coalition

BAVC is the nation's largest nonprofit media arts center dedicated to providing access to media, education, and technology. BAVC has been instrumental on many fronts with video preservation, but one for which it is best known is the establishment of the first professionally equipped, non-profit preservation center.

Vtape

Video treatment services include cleaning and re-mastering. Capable of re-mastering AV and CV 1/2" to Betacam SP and consumer formats. V tape is a non-profit media arts center that distributes and exhibits video art and independent documentaries, and provides access to video preservation services. Members include video artists, video centers, art galleries, museums and researchers. V tape also provides in-person consultation on related issues.

Commercial Facilities

The companies appearing below are listed in the Magnetic Media Preservation Sourcebook, available from [Media Alliance](#) Inclusion on this list does not imply an endorsement of the facility. This is not a complete listing. Descriptions of services can be found at the organization's website or in the Sourcebook.

Video and Audio

[VidiPax](#)

[Roland House](#)

Video

Obsolete Tape Transfer Division of RGB Broadcast Corp. Philadelphia, PA

[DC Video Post](#)

[WRS Motion Picture & Video Laboratory](#)

[Specs Brothers](#)

[Film Technology Company, Inc.](#)

Audio

[Chace Productions](#)

Adrian Cosentini

[NT Audio Video Film Labs](#)

[Richard Hess, Audio Preservation](#)

[Smolian Sound Preservation](#)

Further Reading

Boyle, Deirdre. Video Preservation: Securing the Future of the Past. New York, NY: Media Alliance, 1993. Extensive bibliography, and anecdotal information about early experiments with in the media arts field.

Conrad, Tony, "Open Reel Videotape Restoration," The Independent, October 1987.

Feist, Rick. "What the Manual Didn't Tell You: Film/Tape Image Conversion." The Independent, vol. 15, no.1 (January/February 1992).

Fifer, Sally Jo, Tamara Gould, Luke Hones, Debbie Hess Norris, Paige Ramey and Karen Weiner (eds.), [PLAYBACK: A Preservation Primer for Video](#), San Francisco, CA: Bay Area Video Coalition, 1998. See chapters "Video Analysis and Evaluation" and "Maintaining Technology-based Installation Art", both by Mark Roosa; also "Toward and Institutional Policy for Re-mastering and Conservation of Art on Videotape at the San Francisco Museum of Modern Art."

Kesse, Erich. [Archival Copies of Video Tapes](#) University of Florida, George A. Smathers Libraries, n.d. A description of their procedures for caring for their tapes, including deciding when, what and how to re-master.

Lindner, Jim. [Confessions of a Videotape Restorer or How Come These Tapes All Need to be Cleaned Differently?](#) N.d.

Murphy, William T. [Television and Video Preservation](#) 1997, Washington, DC: Library of Congress, 1997. See the chapter "The Materials and their Preservation Needs" for a discussion of cleaning and re-mastering techniques. You may also order it from the Library of Congress.

Shulman, David, "Deja View: Restoring and Re-mastering Open-Reel Videotapes," *The Independent*, October 1991.

Tape Formats and Hardware - Research and Planning Efforts

- [Research and Planning Efforts](#)
- [Tape Format Guides and Descriptions](#)
- [Sources for Information on Hardware](#)

Research and Planning Efforts

While some of the sources below contain information about newer formats and hardware, the emphasis in our research was obsolete or endangered formats and hardware.

[Experimental Television Center](#)

The Video History Project has an area devoted to Tools, which contains technical information and descriptions of early commercial and artist-crafted instruments.

[Independent Media Arts Preservation](#)

Through some of its earlier research efforts, work was begun on the possible development of a resource guide devoted to technical resources and expertise - a compilation of sources of older equipment, parts, software, manuals, and schematics as well as contacts for inventors, engineers, repair places and the like.

[Media Alliance](#)

Through the [Magnetic Media Preservation Sourcebook](#) preliminary research was done on sources of older equipment.

[Specs Brothers](#)

Specialists in tape restoration and disaster recovery, Specs Brothers publishes relevant preservation information on the website.

Tape Format Guides and Descriptions

Ampex Corporation. *A Guide to Media and Formats*. Redwood City, CA: Ampex, Magnetic Tape Division, 1989.

[Ampex Virtual Museum](#) by Howard Sanner has historical information about Ampex devices and some reprinted publications.

[Consumer Video Formats](#)

[Iisakkila, Mika](#) Video recording formats

[Lion Lamb Quadruplex Park](#)

An extensive and detailed technical definition of most of the early formats used in video recording.

Murphy, William T., [Television and Video Preservation](#) 1997. Washington, DC: Library of Congress, 1997.

See the chapter "The Materials and their Preservation Needs" tape charts.

Stauderman, Sarah. [The Video Format Identification Guide](#)

This site can assist you in identifying the various videotape formats in your collections; over 50 different video formats have been used since the technology was introduced in the 1950s. The formats are organized by time periods, with an indication of the difficulty of accessing the technology. This information and pictures were put together as part of the [Electronic Media Special Interest Group](#) of the [American Institute for Conservation of Historic and Artistic Works \(AIC\)](#).

[VidiPax](#)

Video Format Guide offers Videotape Format Characteristics and Videotape Format Descriptions with a picture of each.

Sources for Information on Hardware

AMIA-L

[The Association of Moving Image Archivists](#) maintains a listserv focusing on topics relating to the preservation of moving images. AMIA-L@lsv.uky.edu for posting; listserv@lsv.uky.edu to subscribe.

[Dave Jones Design](#)

Specializes in custom designs of equipment and systems for artists and has assisted museums in re-creating installations which depend on obsolete equipment and techniques.

[Dead Media Project](#)

The site has extensive links to technology and a discussion group. The [Working Notes](#) contains information about devices.

[Bob Ketchum A Timeline of Audio/Video Technology](#)

[Labguy](#)'s The History of the Video Tape Recorder before Betamax and VHS

[Museum of Early Video Editing Equipment and Techniques](#)

[Steve Schoenherr Recording Technology History](#)

[VidiPax](#)

VidiPax has an on-line museum. The VidiPax web site includes articles and a video preservation links section. Links range from associations, organizations and professional groups to technical resources

[Video Expert](#)

Detailed technical information about video, and how it works. Includes description of how analog video is recorded, and the use of test signals and equipment

Insurance and Disasters

- [Insurance and Disaster Plans](#)
- [Resources For Disaster Planning and Recovery](#)
- [Links for More Information](#)

Insurance and Disaster Plans

The planning you devote to the care, handling and storage of your collection will help you to prevent physical harm to your collection, caused by such things as flooding, exposure to contaminants, magnetic fields and other hazards.

Insurance can help you recover materials after a disaster has occurred, but you need to carefully consider the type of protection you need and can afford. You will need to establish the value of your collection, which can be especially difficult if you have unique tapes; there may not be a large commercial market on which to base valuation. Can the content be replaced and at what cost? If your tapes are in an off-site building, a public storage facility, or in the care of another institution you should be clear about what coverage you have from which organization and from which company. Often storage facilities are only liable for the loss of the blank medium, and are not responsible for loss of content. You need to understand what "replacement value" entails. You must clearly state whether you wish to insure the content value, or you may only be insured for the replacement of the blank recording medium. Coverage for content is often very expensive. You can also consider insuring for the costs of restoration, rather than content.

A disaster plan is important so that you know how to respond appropriately in the event of damage. You will need to assess existing damage, understand how to minimize any further damage, and prioritize your responses. You will also need a method to help you decide what steps you can take in-house and when you need to seek professional help. If you need to contract for outside services it will be important that you have a clear idea of the value of each of the damaged tapes, so you can make appropriate choices about recovery attempts.

Resources For Disaster Planning and Recovery

[BMS CAT Special Technologies](#)

[Heritage Resource Management Associates](#)

[Smolian Sound Preservation](#)

[Specs Brothers](#) web offers detailed information with a FAQs page

[VidiPax](#)

Links for More Information

[American Institute for Conservation of Historic and Artistic Works](#)

[ConservationOnline \(CoOL\)](#)

a comprehensive listing of organizations with disaster and recovery information

[National Media Lab](#)

National Technology Alliance Online access to the National Media Lab's Media Stability Technical Reports. Including information on Damage and Disaster Recovery.

[Solinet](#) listing of online resources

Van Bogart, John. [Disaster Recovery Plan: Recovery of Damaged Magnetic Tape and Optical Disk Media](#) Presentation by John Van Bogart at a Library of Congress Symposium on September 21, 1995.

Ethics and Copyright

Many video collections have evolved without any clear collection policy. An important part of planning for a preservation program involves the complex areas of copyright, fair use and the ethical relationship between the collector and the works. It includes ascertaining the legal authority for the tapes you have. How did you acquire the work? Do you have written documentation which substantiates this? Were signed releases and clearances executed when the tape was produced? Do you have the legal right to duplicate or to exhibit the work? If so, under what circumstances?

Many states also have volunteer legal services to assist artists and arts organizations. [New York State Volunteer Lawyers for the Arts](#) is located in Manhattan. [The Philadelphia Volunteer Lawyers for the Arts](#) is a non-profit legal services organization founded in 1978 to provide legal help to the area's artists and cultural organizations. The site has a links and resources section with a list of all volunteer lawyers for the arts organizations in the United States as well as US Government offices.

The [U.S. Copyright Act](#) of 1976 and all subsequent amendments is available from the U.S. Copyright Office as a downloadable PDF file.

The following links provide extensive information about this important and complex area.

[Conservation OnLine Copyright](#), intellectual property and ethics

[Conservation OnLine Ethics](#) and copyright

[Library of Congress Copyright Office Circulars](#)

Circular 1 - Copyright Basics

Circular 22 - How to Investigate the Copyright Status of a Work

[Stanford University Libraries Copyright](#) and fair use issues, with current legislation, and cases

[Solving the Dilemma of Copyright Protection Online](#). The Journal of Electronic Publishing. December, 1997, Volume 3, Issue 2.

[Who Owns What? Intellectual Property, Copyright, and the Next Millennium](#). The Journal of Electronic Publishing, March 1999, Vol. 4.

[Code of Ethics and Guidelines for Practice](#). American Institute for Conservation of Historic and Artistic Works

[The Society of American Archivists Code of Ethics for Archivists](#)

Learning More About Video Preservation

- [Selected Bibliography](#)
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Selected Bibliography

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On Line Bibliographies

Amigos Library Services
[Preservation of AV Materials](#)

[Berkeley Digital Library SunSITE Preservation Resources](#)

[Conservation Online Electronic Media Resources](#)

[Grinnell College Libraries A Selective Preservation Bibliography](#) Compiled and annotated by Rebecca Stuhr

[Harvard Library Preservation Bibliographies: Care and Handling of Videotape](#)

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[Society of American Archivists Selected Readings in Preservation](#)

[Solinet Publications on Preservation](#)

[US-InterPARES Project Preservation Bibliography](#)

Resources for Education and Training

General Information on Preservation Training Programs
["Becoming a Conservator within the US"](#). American Institute for Conservation of Historic and Artistic Works training programs

Lukow, Gregory "[Careers in Moving Image Preservation](#)"

Society of American Archivists [Directory of Archival Education in the United States and Canada](#)

Directories and Programs for Preservation of Film and Electronic Media
[American Library Association](#) publishes the ALA/ALCTS Preservation Education Directory.

[AMIA](#) Association of Moving Image Archivists Scholarship Program

ARCHIMEDIA European Training Network for the Promotion of Cinema Heritage:

[International Federation of Film Archives Summer School](#) (FIAF)

[Film Archives On Line](#).

[George Eastman House L. Jeffrey Selznick School of Film Preservation](#)

[International Federation of Film Archives Summer School](#)

[New York University Preservation Department](#)

[Society of American Archivists](#) publishes the SAA [Directory of Archival Education](#)

[UCLA Moving Image Archive Studies Program](#)

[University of New South Wales Internet Classes in Audiovisual Management](#)

Support and Funding

American Institute for Conservation of Historic and Artistic Works

The Foundation of the American Institute for Conservation (FAIC) was awarded a three-year grant from the Samuel H. Kress Foundation to implement the Kress Conservation Publication Fellowships. The purpose of these fellowships is to allow conservation professionals release time from work obligations to prepare publishable manuscripts in order to increase the written body of knowledge available for the conservation field.

Association of Moving Image Archivists

AMIA provides the Mary Pickford Scholarship and SONY Pictures Scholarships which offer an award of \$3,000 as financial assistance to a student of merit who intends to pursue a career in moving image archiving.

Association for Recorded Sound Collections

The Grants Program encourages and supports scholarship and publication by individuals in the field of sound recordings or audio preservation.

Bay Area Video Coalition

Individual members of BAVC working on non-commercial programs are eligible for in-kind access to BAVC's media facility, including equipment in the Video Preservation Center, which offers access to 1/2" open reel decks. BAVC takes special interest in video artists who are working on projects in association with community groups or about community issues. Grants are provided for \$1,500 worth of access to BAVC's media facility.

Institute of Museum and Library Services

IMLS is a federal agency that provides grants to U.S. museums and libraries, and encourages partnership between museums and libraries. The definition of museums includes such diverse groups as art museums, historic sites and zoos. Among the areas of support from the Office of Museum Services are:

- Conservation Project Support that helps museums care for their collections
- Conservation Assessment Program that assists museums to establish preservation priorities

National Leadership Grants are also available for activities that include preservation or digitization of library materials and resources. For Conservation Project Support, grants are up to \$50,000, or in the case of exceptional projects, up to \$75,000. Eligible activities include surveys, training, research, treatment and environmental improvements.

National Academy of Recording Arts and Sciences

NARAS provides grants to organizations and individuals for efforts that advance the archiving and preservation of America's music and recorded sound heritage. For example, in the 1997-98 grant cycle, the Research Libraries Group, Inc. was funded to create and make available a single, comprehensive, Internet-accessible information source that includes the best practices and relevant technical standards for the preservation of information stored on magnetic media. Priority is given to projects of national significance, and grant amounts generally range from

\$5,000 - \$15,000 although for projects of particularly broad scope or importance applicants may request support in excess of the stated guidelines.

National Endowment for the Arts

NEA Heritage & Preservation goals are to assist, preserve, document, and present those artists and forms of artistic expression that reflect our nation's diverse cultural traditions, and to conserve important works of art.

Projects may include, but are not limited to:

- Documentation and/or presentation to the public of artists and art forms that reflect our diverse cultural traditions and heritage
- Apprenticeships or other forms of instruction that pass on to future generations repertoire, technique, aesthetic principles or oral traditions
- Documentation and/or preservation of significant artistic works, styles, techniques, and aesthetic cultural perspectives
- Technical assistance to traditional folk artists
- Publications that document and/or disseminate artistic works models of preservation, or other materials aimed at strengthening our artistic heritage
- Conservation treatment of highly significant works of art, artifacts, and collections wholly owned by the applicant;
- Innovative uses of modern technology to preserve and strengthen our artistic heritage.

Grants generally range from \$5,000 to \$200,000 and require a match of least one to one.

National Endowment for the Humanities

The NEH Division of Preservation and Access provides leadership and support for a sustained national effort to create, preserve, and increase the availability of resources that support research, education, and public programming in the humanities and that are of critical importance to our cultural heritage. Priority is placed on the support of major education and training programs and research and demonstration projects that will help establish a permanent infrastructure of knowledge for preservation and access activities in the United States. A high priority is also placed on applications for model projects that explore or resolve critical issues relating to the effective use of digital technology for preservation and access. Among the grant categories under the Division are the following:

- Special Collections and Archives - Proposals for projects to preserve and create access to special collections and archives may encompass the arrangement, description, and preservation of archival and manuscript collections; and the cataloging and preservation of graphic, still and moving image, and recorded sound collections (including their transfer to more stable media such as film stock or reel-to-reel audio tape). The division also supports projects to conduct archival surveys that will increase the availability of significant humanities resources. Grants for institutional and consortia projects involving special collections and archives have ranged from \$30,000 to \$650,000 for a two-year project. Grantees are expected to contribute at least 50 percent of the project's total cost.
- Education and Training Programs - The Division provides grants for education and training programs at the national or regional (multi-state) level that focus on the care of library, archival, and material culture collections. Awards are also made to create or

enhance regional preservation field services, which offer surveys, consultancies, training courses and informational materials to the staff of institutions responsible for the care of humanities collections. Grants have ranged from \$60,000 to \$517,000 for projects of up to three years in duration. The Endowment's support will not exceed 80 percent of the total cost of these projects.

- Research and Demonstration Projects - Proposals are accepted to develop new preservation procedures and techniques or engage issues that have a national impact on libraries, archives, and museums. The division especially encourages applications for model projects that will establish standards or a consensus of best practice for the use of electronic technology for preserving or creating trans-institutional access to humanities resources. Research and demonstration grants have ranged from \$141,000 to \$350,000. NEH's contribution to the total cost of the project will not exceed 80 percent.

National Historic Publications and Records Commission

NHPRC is the grant-making affiliate of the National Archives and Records Administration (NARA). NHPRC makes grants to state and local archives, colleges and universities, libraries, historical societies, and other nonprofit organizations throughout the U.S. Among its mandates are:

- collecting, describing, preserving, compiling, and publishing (including microfilming and other forms of reproduction) of documentary sources significant to the history of the United States
- conducting institutes, training and educational programs, and fellowships related to the activities of the Commission
- disseminating information about documentary sources through guides, directories, and other technical publications
- documentary editing and publishing; archival preservation and processing of records for access; developing or updating descriptive systems; creation and development of archival and records management programs; development of standards, tools, and techniques to advance the work of archivists, records managers, and documentary editors; and promotion of the use of records by teachers, students, and the public.

National Initiative to Preserve America's Dance

NIPAD's mission is to foster America's dance legacy by supporting dance documentation and preservation as an integral and ongoing part of the creation, transmission and performance of dance. NIPAD is a component of SAVE AS: DANCE, a national partnership funded by The Pew Charitable Trusts to advance the ability of dance artists and dance communities to document and preserve their work and traditions. The NIPAD grant program is open to the fullest range of preservation practices, inclusive of all documentation formats. NIPAD funds may be used to support a range of activity, with the primary focus on the most effective approaches to documenting and preserving dance. During the life of its grant, NIPAD expects to provide \$1.5 million over three rounds of funding to approximately 10 to 15 exemplary projects.

New York State Council on the Arts

The Electronic Media and Film Program (EMF) is dedicated to furthering the artistic, conceptual and administrative growth of the fields of audio, film, radio, television, video and multimedia

moving image art. The Program supports production, distribution, exhibition, preservation and services necessary to allow its diverse constituencies to develop in directions appropriate to each medium, activity or community.

NYSCA funds projects in New York State in the area of audio, video & film preservation, support is available for cataloguing efforts, lab work, access to low-cost storage facilities, special projects and collaborative efforts that significantly advance work in film and magnetic media preservation. These projects can include public/private partnerships, consortium proposals, planning funds for the transfer specialized collections to appropriate archival institutions and requests for technical assistance.

New York State Library

NYS Program for the Conservation and Preservation of Library Research Materials. The purpose of the Discretionary Grant Program is to encourage the proper care of research materials in the State, to promote the use and development of guidelines and standards for conservation/preservation work, and to support the growth of local and cooperative preservation programs. Grants are awarded for projects that contribute to the preservation of significant and endangered research materials in libraries, archives, historical societies and similar agencies in New York State. Grants of up to \$25,000 support projects for the protection, care and treatment of library materials valuable to New York State, preventing loss of their informational or intellectual content and/or the objects themselves. Projects may include such areas as preservation surveys, educational programs, maintenance of collection materials, reformatting, environmental control, and improvement of collection storage environments. At this time video re-formatting projects are not eligible for funding; however, re-formatting of sound recordings may be eligible depending upon the plan of work. Applications are typically due in early December of each year; contact the office above for most current information.

New York Women in Film & Television

NYWIFT offers a Women's Film Preservation Fund for the preservation or restoration of American films in which women had significant creative positions. Individuals and not-for-profit organizations are eligible to apply for grants of up to \$10,000.

VidiPax, Inc.

VidiPax provides consulting services, and treatment including cleaning, disaster recovery, inspection/evaluation, repair/restoration, and re-mastering. VidiPax has offered assistance for restoration work for organizations and individuals if funding is received for the project from a government, foundation, or corporate funder.

Preservation Links

References to these sites are found throughout the Preservation area.

[Archivists Round Table of Metropolitan New York, Inc.](#)
[American Film Institute](#)
[American Institute for Conservation of Historic and Artistic Works](#)
[American Library Association](#)
[American National Standards Institute](#)
[Archive Impact](#)
[Archive Index](#)
[Association for Recorded Sound Collections](#)
[Association of Moving Image Archivists](#)
[Audio Engineering Society](#)
[Bay Area Video Coalition](#)
[Behavioral Images, Inc.](#)
[BMS CAT Special Technologies](#)
[Boston Art Conservation](#)
[Conservation OnLine](#)
[Council on Library and Information Services](#)
[DC Video Post](#)
[Documentary Arts](#)
[Electronic Arts Intermix](#)
[Electronic Media Group Homepage](#)
[Electronic Special Interest Group of AIC](#)
[Experimental Television Center Ltd.](#)
[FIAT/IFTA - The International Federation of Television Archives](#)
[Footage](#)
[G.M. Wylie Company](#)
[George Eastman House Selznick School of Film Preservation](#)
[Heritage Resource Management Associates](#)
[Hollywood Vaults](#)
[Iamhist](#)
[Independent Media Arts Preservation](#)
[Institute of Museum and Library Services](#)
[International Association of Sound Archives](#)
[InterPARES Project](#)
[Library of Congress](#)
[Light Impressions Direct](#)
[National Academy of Recording Arts and Sciences](#)
[National Film Preservation Board of the Library of Congress](#)
[National Film Preservation Foundation](#)
[National Historic Publications and Records Commission](#)
[National Initiative to Preserve America's Dance](#)
[National Media Lab](#)
[National Technology Alliance](#)
[Northeast Document Conservation Center](#)
[NT Audio Video Film Labs](#)

[Pacific Film Archive](#)
[Recorded Information Management](#)
[Regional Alliance for Preservation \(RAP\)](#)
[Research Library Group](#)
[Richard Hess, Audio Preservation](#)
[Roland House](#)
[ScreenSite: Film/TV/Video College Programs](#)
[ScreenSound Australia](#)
[Society of American Archivists](#)
[Society of Motion Picture and Television Engineers](#)
[Solinet](#)
[SPECS BROS.](#)
[The International Association for Media and History](#)
[The International Federation of Television Archives](#)
[UCLA Film and Television Archive](#)
[University Products, Inc.](#)
[Video Data Bank](#)
[VidiPax](#)
[Vtape](#)
[WGBH Universal Preservation Format Initiative](#)
[WRS Motion Picture & Video Laboratory](#)